

4.0 Environmental Consequences

This chapter projects future consequences of the five alternatives discussed in this Draft Environmental Impact Statement.

Because the Little Darby National Wildlife Refuge is proposed on a willing-seller-only basis, it is difficult to predict precisely when specific conditions or events will occur. The Service cannot predict when people might be willing to sell land, nor can we anticipate how much land might be sold and where it might be located. Thus, anticipating the future requires a few assumptions. The assumption we made for the purpose of this analysis is that it will take at least 30 years to complete acquisition of this national wildlife refuge. It could easily take more.



With that assumption, this chapter analyzes potential impacts to the physical environment, the biological environment and the socioeconomic environment for the No Action Alternative and the four Action alternatives. In analyzing the physical environment we looked at what a refuge might mean to agriculture, drainage and flood control and water quality. Study of potential impacts to the biological environment included consideration of biological diversity and the potential for disease for wildlife to spread disease to livestock and humans. In studying potential socioeconomic impacts we looked at economic impacts, Service land acquisition and funding, property taxes, Refuge Revenue Sharing payments, relocation benefits, private property rights adjacent to refuge lands, cultural resources and public use.

A variety of general impacts are also addressed in this chapter, including short-term versus long-term productivity, irreversible commitments of resources, road maintenance and right-of-way, the use of fire in wildlife habitat management, emergency services, and seismic activity. Potential impacts to the Madison County Airport are also examined.

In this chapter, the potential environmental consequences or impacts of the No Action Alternative and the four Action alternatives are evaluated in terms of the opportunities and issues raised by the public, resource managers and elected officials during the scoping process for and review of the Draft Environmental Assessment and during scoping for the and Draft Environmental Impact Statement. The No Action Alternative, which assumes a status quo condition, is used as a yardstick by which to measure the impacts of the Action alternatives.

In evaluating the potential environmental consequences for the four Action alternatives, it must be noted that because of the willing-seller-only acquisition policy inherent to Alternatives 1-4, there is no reliable way to predict when or where particular land parcels might be acquired. Based on this uncertainty, it is

problematic at best to identify specific time schedules with locations for implementation of refuge management programs and land use changes. However, to facilitate meaningful analysis, project acquisition and development were projected to take 30 years. In reality, it may take much longer. In the meantime, acquired areas would be developed and management programs would proceed according to the size and location of lands purchased.

Alternative 2 is presented as the Service's Preferred Alternative at this time.

4.1 Potential Impacts to the Physical Environment

This section examines the impacts of five alternatives on water quality, air quality, agricultural land, drainage, and flood control. The discussion covers watershed conservation, hydrology and wetlands, drainage, groundwater and air quality, and cropland depredation and pest control.

4.1.1. Alternatives 1-4 (Action)

4.1.1.1 Water Quality in Darby Creek Watershed

With the range of these alternatives, we would expect water quality to improve, primarily because of the potential removal of farmland from agricultural production in the Voluntary Purchase Area and a long-term commitment to the maintenance of conservation-based agriculture within a Watershed Conservation Area. The primary difference between the Action alternatives is the extent of protection focused upon 1) the Spring Fork drainage, 2) the upper reach of the Little Darby Creek, 3) wetland restoration emphasis and 4) range of watershed conservation. Alternatives 1-4 propose Voluntary Purchase areas of 24,735 acres; 22,783 acres; 20,772 and 21,016 acres respectively (see Table 2 on page 47). Although this acquisition would potentially occur over a relatively long time (at least 20-30 years), the ultimate result would be a substantial reduction in sediments and farm chemicals entering drainages and the overall watershed. Restoring and developing emergent wetlands, wet prairie, and certain uplands would increase the water filtration and ground water recharge capabilities within the Little Darby watershed. Wet soils suitable for wetland or wet prairie restoration within the Voluntary Purchase Area include 9,672 acres under Alternative 1; 9,085 acres under Alternative 2; 8,931 acres under Alternative 3 and 8,320 acres under Alternative 4 (see Table 2).

Miles of streams encompassed within the Voluntary Purchase Area that could eventually be permanently protected or restored include 95 miles under Alternative 1; 107 miles under Alternative 2; 79 miles under Alternative 3; and 99 miles under Alternative 4.

Restoring riparian forests would decrease corridor erosion problems occurring in the upper end of the project area. The latter alone, however cannot achieve Service fish and wildlife habitat protection and restoration objectives. Terrestrial and aquatic ecosystems and related land uses are hydrologically inseparable; Service goals and objectives reflect this fact in the range of alternatives presented.

Under these alternatives, the Service would cooperate with appropriate agencies and individuals to ensure that lands identified as important for agriculture, and within the designated Watershed Conservation Area, are protected from devel-

opment. This could involve the use of conservation easements, and facilitating land protection and funding alternatives in cooperation with public and private interests. The former would embrace other Federal, state, and local agencies. The Service can institute regular water quality monitoring activities to identify specific pollutants and their sources, or facilitate the formation of a community-based cooperative composed of students, community leaders, farmers, conservation groups, and others to work together in addressing water quality issues.

4.1.1.2 Air Quality

Impacts to air quality under the four Action alternatives would be expected to remain the same or slightly improve as land is protected, thereby reducing urban or rural development and the associated impacts that would be expected from it. Traffic associated with visitation to the proposed refuge would be dispersed and limited by season. The principal refuge management activity that may seasonally affect air quality would be prescribed burning of established grasslands. These activities may not be conducted every year and generally occur during the early spring or late winter months when the likelihood of air inversions are minimal. The use of fire for wildlife habitat management purposes is used annually by the Ohio Department of Natural Resources and is governed by the Ohio Administrative Code 3745-19, Ohio Fire Code Section F-403.0, and Ohio Revised Code Section 1503.18. No specific prohibitions against prescribed burning are mandated by these laws. The use of prescribed fire is also discussed in the Interim Comprehensive Conservation Plan in Appendix I.

Smoke generated by the use of prescribed fire for management and maintenance of grassland habitat is an unavoidable adverse impact. It is an impact of short duration. The use of fire for wildfire habitat management purposes in the Midwest is significantly less threatening than in the intermountain west where humidity is much lower, there is less precipitation, natural and man-made fire breaks are much less extensive, terrain carries fire more quickly, and vegetation/fuel is much more prone to being volatile. High fire risk seasons in the Midwest are uncommon except for heavy forested areas in more hilly terrain. People have expressed concern that a damaging wildfire could occur on the proposed Little Darby National Wildlife Refuge similar to the fire that occurred near Los Alamos, New Mexico, in the spring of 2000. Such a wildfire in the Little Darby project area could not occur given the terrain and climate differences between Ohio and New Mexico.

4.1.1.3 Agricultural Land

The potential impacts to agriculture from the Action alternatives are discussed in detail in the appended Economic Impact Assessment.

Alternatives 1-4 could result in reduced agricultural production when existing croplands are converted to wetland or grassland. Approximately 20,000 acres of cropland (see Table 2 on page 36) could be acquired by the Service (from willing sellers only) and converted to wildlands over the next 30 years. However, this conversion would not be irreversible. If in the future it is determined that these lands are needed for agricultural production, the soil would be rested and ready for crop production. If, on the other hand, the land is developed, it is very unlikely that it could ever be converted back to agricultural production and prior public investments in conservation and agricultural programs would be lost. Certain programs, such as the Conservation and Wetland Reserve Programs and state and Federal private lands programs, offer landowners short and long-term

contracts while keeping land in private ownership. Any conversion of agricultural land to other uses would occur gradually as acquisition and habitat restoration dollars become available and as landowners willing to participate or sell are identified.

In some areas of the study area, landowners have expressed concern for the impact that the restoration of wetlands on Refuge lands would have on neighboring farms. The Service is committed to limiting the impact of its restoration activities to Service-owned or managed lands. Site-specific hydrological evaluations will identify wetlands that can be restored without adversely impacting adjacent private property. Service staff will also draw from their own experience and the experience of other organizations, agencies, and individuals conducting wetland restoration inside and outside of the watershed. The Service has restored more than 10,000 wetlands throughout the Midwest on private farmlands through our Partners for Fish and Wildlife Program without adverse consequences. In addition the Service will establish a Drainage Advisory Board to insure that restoration activities do not adversely impact adjoining lands (Appendix I, Interim Comprehensive Conservation Plan).

...The Service is not interested in acquiring and does not have any plans to acquire residential or commercial properties in residential areas, and incorporated or unincorporated villages.

The Service is also aware of the concern expressed by some landowners and business people that the proposed Refuge could reduce the amount of farmland in a county below some sustainable threshold. The 22,783 acres of the Voluntary Purchase Area in the preferred alternative are predominantly limited to Madison County and makes up 9 percent of that county's cultivated cropland. In addition, the Service is not interested in acquiring and does not have any plans to acquire residential or commercial properties in residential areas, and incorporated or unincorporated

villages. Federal acquisition of all land in the largest Voluntary Purchase Area in Alternative 1 would account for 2 percent of the 1997 land in farms in the Columbus area. Other causes have resulted in a 12 percent loss of farmland in the Columbus area from 1982 to 1997, primarily in Franklin County. Three of the Action alternatives include 15,000 to 26,000 acres in the Watershed Conservation Area. This could significantly slow the loss of farmland-to-residential development, but at the expense of residential development. In addition, since acquisition will occur over 30 years or longer, communities will have a reasonable time period to adapt to the proposed land use changes. Current development pressure in the watershed is increasing and will likely equal or exceed that of the proposed refuge alternative if the refuge is not established. Near-term agricultural land use conversion rates are evidence of this effect.

Alternatives 2-4 establish a secondary acquisition boundary that focuses upon watershed conservation. Alternatives 2, 3 and 4 propose voluntary Watershed Conservation areas of 26,419 acres, 25,237 acres and 15,914 acres respectively (see Table 2 on page 47). This area is designated to facilitate the long-term protection of agricultural land uses in Union and Madison counties surrounding the core voluntary fee acquisition or biodiversity protection areas. By establishing this boundary, it is the Service's intention to use less than full fee acquisition easements when necessary, and/or facilitate the same by other public and private concerns, to maintain and protect agriculture as the dominant private land use. The Service's priority acquisition focus would be within the designated fee or biodiversity protection boundary.

In Madison County, more than half of the cropland is worked by people who do not own it. A significant proportion of this is in the project area. The owner of a resource is the sole decision-maker for its use in the American landownership system. There are few constraints, such as zoning and liability issues, on landowners' use decisions. From 1982 to 1997, Madison County saw approximately 17,000 acres of farmland converted to other uses (Ohio Agricultural Statistics Service, 1999, and The Ohio State University Extension Service, 1999). The landowners may convert cropland to other uses based upon recent trends whether there is a refuge or not. The implementation of a watershed conservation program may provide landowners economically viable alternatives to conversion of their land to non-agricultural uses. Conservation easements will be considered in the Voluntary Purchase Area as well.

a) Prime Farmland

The proposal's contribution to the loss of "prime" farmland in the state has been discussed extensively. The proposal to establish the Little Darby National Wildlife Refuge ultimately depends on decisions made by landowners within the proposed Voluntary Purchase Area. In most respects, this is no different than a decision of any landowner to freely sell his or her property to another party for any use that is permitted by the state and county's land use regulations. Approximately 11 million of the 14 million acres of farmland in Ohio are designated as "prime" by the U.S. Department of Agriculture. However, this classification has not historically protected "prime" farmland from being converted to other uses in the state. Since 1970, approximately 3 million acres of farmland have been converted to other uses in the state. The great majority of these conversions have not been for conservation purposes.

Federal conservation programs such as the Conservation Reserve Program (CRP) and Wetland Reserve Program (WRP) have been in place for roughly 15 years. The Conservation Reserve Enhancement Program has only recently been available, but at greater cost to each state. Although their objectives are varied, a primary premise for their institution was to provide a conservation option that would reduce the amount of land in cropland production and thereby mitigate producer surpluses and stabilize or raise crop prices. It is widely recognized that even with the institution of these programs, and the concomitant withdrawal of hundreds of thousands of acres of farmland nationwide, surplus food production still occurs. With the exception of the WRP, these programs are relatively short in duration and lands enrolled in CRP rotate in and out of production every 10 years. In reality, the WRP is a land acquisition program that imposes deed restrictions upon landowners. Eventually, most lands enrolled in CRP will possibly return to production at some point in the future. In many respects, both of these programs are similar to the refuge proposal. While the refuge would take some land out of production, as does CRP and CREP, it could be brought back into production by Congressional mandate if absolutely needed (even though acquisition in the Voluntary Purchase Area would be in perpetuity). Most of the land in the state that has been converted to non-agricultural uses cannot be restored for cropland production.

The indirect effect a refuge would have on current direct Federal payments to producers in the Voluntary Purchase Area by the U.S. Department of Agriculture is another factor that has not been considered. While it is not the purpose of this discussion to precisely quantify this effect, potential acquisition of farmland in the project area would likely reduce current Federal payments to producers for a range of programs administered by the U.S. Department of Agriculture.

Federal payments to producers statewide amounted to \$141 million in 1997 (USDA, 1997). These payments have doubled and tripled in 1998 and 1999. From 1998 through the beginning of 2000, total Federal payments to producers in Madison and Union counties was in excess of \$24 million and \$22 million respectively (USDA, 2000). In reality, it is reasonable to expect that a reduction in these annual payments would result on lands acquired for a refuge. This reduction would partially offset the Federal cost of the refuge over the life of the project. If Federal payments to producers continue, it could be argued that at an undetermined time in the future, a defacto savings may result to the public from the limited conversion of farmland to conservation in the Voluntary Purchase Area.

Overall, the effects of the proposed refuge upon “prime” farmland must be viewed in context of national and state policy regarding farmland protection and private property rights. So long as farmland is held privately, its disposition will be determined primarily by local land use regulations and the free market. This situation has not resulted in the curtailment of farmland losses even with a myriad of Federal and state agricultural incentive programs. Federal conservation mandates and programs, of which this proposal is a part, represent a national interest no less important than that for agriculture. In comparison to other competing land uses, conservation programs have an insignificant impact upon the production of food nationally.

In considering this impact, the Service has reviewed the Federal Farmland Protection Act, which is administered by the U.S. Department of Agriculture, Natural Resources Conservation Service. In their opinion, this mandate would not affect the Service’s proposal because the establishment of a refuge would not be an “irreversible change of farmland”. (See letter number 794A-B in Appendix M) On a broad scale, this proposal will have no noticeable effect upon state and nationwide food production over the life of the project.

b) Refuge Induced Development

There is anecdotal evidence that open space does attract urban development, especially in close proximity to areas already developed. However, the project area is already well situated in terms of factors necessary to attract development, including its proximity to metropolitan Columbus, established transportation corridors, and nearby and in-county economic development. Real estate interest in residential and commercial development has preceded the Service’s proposal to establish the refuge. The villages of Plain City and West Jefferson have notable examples of new and anticipated residential and industrial development in close proximity to the proposed project area. Well in advance of the Service’s proposal, the Jonathan Alder and Fairbanks school districts have projected enrollment increases indicative of significant population growth related to new development. (See school district funding discussion in the Economic Impact Assessment, Appendix H.) The Service has no broad authority to regulate the use of private land. This authority rests principally with local, county, and state government. If the local units of government perceive the proposed refuge as encouraging an increased rate of residential and commercial development, it is within their authority to exercise the regulatory power granted to them by the state to control development. The *Madison County Farmland Preservation Plan* is an attempt to do this.

If it is assumed that an established refuge would induce a greater rate of development, the Service has no jurisdiction to affect control. One might presume that

if the local land use authority cannot reasonably affect control of development with an established refuge, then it cannot accomplish the same objective without the refuge. Local land use controls should work with or without the presence of a refuge. In truth, there is no accurate way to determine the refuge's effect upon increasing new development because of the voluntary nature of the project.

4.1.1.4 Drainage and Flood Control

Development of a national wildlife refuge (Action alternatives 1, 2, 3 and 4) should have little or no impact on the maintenance of existing drainage systems since adequate precautions to avoid impacts are considered during restoration planning. Protection, restoration, and management activities associated with any of the Action alternatives could not legally contribute to flooding on private property, or impede drainage so as to impact private property. The Service would not cause any artificial increase of the natural level, width, or flow of waters without ensuring that the impact would be limited to lands on which it has acquired an appropriate interest from a willing seller. Prior to any wetland development or restoration work, the appropriate level surveys or hydrologic studies would be conducted to determine optimum siting and design.

The Service would have to comply with Ohio Drainage Law, which generally recognizes that property owners cannot legally alter established drainage patterns if that action adversely impacts other land owners. If Service activities create a drainage problem for any private landowner, the problem must be corrected at Service expense. The Service is not proposing to dam, contain, impede or alter the free flow of the Little Darby Creek. Indeed, these activities would be contrary to the Service's stated objectives.

Conversely, lands that would be acquired and taken out of production would lessen the overall loading on drainage system main lines through employing conservation practices that increase water storage and result in a reduction in flow rates. Restored wetlands and wet prairies reduce impacts to drainage systems, including water volume and sediment load. This should reduce drainage system maintenance costs. This would also mitigate the frequency of flow pulses and minimize the difference between in-stream peak and low flows.

If a refuge is developed, drainage issues would be handled on a case-by-case basis. If the Service acquires portions of a drainage system that are part of a state-sanctioned drainage district that has the power to assess maintenance fees, the Service would work with the district before acquiring land to establish agreement on maintenance assessments. Such an agreement could involve an upfront, onetime payment, a commitment to share in maintenance if the drainage would benefit the Service, or some other mutually agreeable strategy. It is also possible for the county receiving Refuge Revenue Sharing payments to redistribute funds to the drainage board or district in an amount equal to their lost revenue.

The Nature Conservancy has tentatively volunteered to establish or contribute to the establishment of a fund that would augment drainage maintenance funding.

To insure that the Service does not adversely impact any adjoining private land, a drainage advisory board will be instituted for the Service to consult with prior to, during and after any anticipated restoration activities. Potential representation may be from the county engineers offices, soil and water conservation

district, NRCS, local producers, ODNR, and Ohio State University Extension. The size, makeup and detailed function will be determined if a refuge is established.

The Service would seek input from interested parties and the public at large in the development of refuge water management plans. As the Service acquires lands within the project area, options for assuring that the activities of each agency would not adversely impact the objectives and responsibilities of the other may include the development of Cooperative Agreements or a similar vehicle with respective County Engineers' Offices and Drainage entities.

Drainage issues with private landowners not associated with a drainage district would also be handled on a case-by-case basis. The Service's intent would be to facilitate the continuation of private drainage that passes through land acquired by the Service. In some cases, the Service may replace – at Service expense – perforated tile on acquired lands with non-perforated tile to accomplish wetland restoration on acquired lands while maintaining adjacent private drainage.

Overall, the Service is responsible for not impeding surface or subsurface drainage across lands that it has a proprietary jurisdiction over.

4.1.1.5 Crop Depredation and Pest Control

Under all four Action alternatives, the refuge staff, in cooperation with the state, would provide technical advice to landowners surrounding the refuge if crop losses occur from migratory birds, deer or other wildlife. The U.S. Department of Agriculture has an Animal Damage Control Division that can provide more direct assistance. Beaver activities on the refuge that threaten public roads would generally be handled by the refuge staff in coordination with the Ohio Department of Natural Resources. Issues of public safety will be addressed expeditiously, especially those involving white-tailed deer. Excessively high deer populations are not desirable from a habitat management standpoint. Excessive browsing and grazing negatively impact the habitat for other wildlife species. The Service manages deer populations to keep them within habitat carrying capacities. This also helps to minimize crop depredation problems and issues of public safety, such as deer/car collisions.

It is Service policy to control plants listed as noxious weeds by the States. This control would emphasize non-chemical methods, however some chemical control is likely. Weed control would be directed to keeping noxious weeds from spreading to adjacent private farmland.

4.1.1.6 Mosquito Control

Two events have prompted Region 3 to re-evaluate mosquito control on national wildlife refuges. The first event was passage of the Refuge System Improvement Act of 1997. The resulting policy has caused us to re-examine our mosquito control activities. In addition, in the summer of 1999 Region 3 closely examined the mosquito control policy at Minnesota Valley National Wildlife Refuge, a refuge within the Minneapolis-St. Paul metropolitan area.

Since 1988, Minnesota Valley National Wildlife Refuge has prohibited treatment of its lands for mosquitoes except in the case of a health emergency. The policy was implemented at Minnesota Valley after the Defenders of Wildlife and other environmental organizations filed a suit against the Service for allowing control of mosquitoes on Refuge lands. An out-of-court settlement was reached after the

Service agreed to conduct an environmental review of its program. Following the completion of an environmental assessment and because of potential negative environmental effects, the Service adopted a policy where treatment on Minnesota Valley National Wildlife Refuge could only occur in the case of a human health emergency. Since the policy was adopted, there has not been a human health emergency associated with mosquitoes on the Refuge.

The Improvement Act states that “the Secretary shall not ... renew or extend an existing use of a refuge, unless the Secretary has determined that the use is a compatible use and that the use is not inconsistent with public safety. The Secretary may make the determinations referred to in this paragraph for a refuge concurrently with development of a conservation plan ...”

Based on the requirements of the Improvement Act and the experience and evaluation of the program at Minnesota Valley National Wildlife Refuge, Region 3 has decided to prohibit treatment of refuge lands for mosquitoes except in the event of an emergency when there is a real and imminent threat to human health.

The Improvement Act says that the Secretary shall not extend a use unless the use is inconsistent with public safety. We think that limiting mosquito control to periods when there is a threat to human health and safety is consistent with public safety.

See Section 4.2.1.3 of this Environmental Impact Statement for a discussion of mosquito-related disease.

Policy

Therefore, the policy of Region 3, U.S. Fish and Wildlife Service is to prohibit treatment of lands for mosquitoes except in the case of an emergency when there is a real and imminent threat to human health. If established, the Little Darby National Wildlife Refuge would cooperate with local officials in the monitoring of mosquito populations on Refuge lands and in the removal of tires or other debris that serve as artificial breeding sites.

Determination of Human Health Emergency

For purposes of treatment of refuge lands for disease-carrying mosquitoes, a human health emergency will be determined by the Regional Director of the U.S. Fish and Wildlife Service in consultation with the U.S. Center for Disease Control, the Ohio Department of Health and other recognized health care professionals.

4.1.2 Alternative 5 (No Action)

4.1.2.1 Water Quality in the Darby Creek Watershed

Waters of the Darby Creek watershed, including the project area, and its tributaries will continue to be chronically affected under the No Action Alternative. Long-term maintenance and improvement through the application of present technology, techniques, laws, and regulations are not anticipated to occur or evolve to address the problems associated with sedimentation, chemical runoff, and the likely increased discharge of urban and industrial runoff associated with development. Sediment loads would remain fairly constant, but excessive, as long as applied conservation practices are neither abandoned nor expanded. If conservation practices are adopted more readily, it is unlikely that a reduction in sedimentation rates can offset the known rates typically associated with residen-

tial and commercial development. Litigation for proposed annexations and rezoning requests to change land use from rural to residential or commercial are anticipated to continue. Presently, there are no state or local laws that provide serious waterway and wetland protection in the watershed, or throughout the state. The last state-sponsored collaborative effort to assess wetland protection and restoration needs, the Ohio Wetlands Task Force in 1994, generally failed to have any recommendations adopted by the state. The Federal Clean Water Act is the foundation for all significant wetland protection in Ohio. Recent court decisions affecting the authority of Section 404 of the Act place greater immediate jeopardy upon the water quality due to allowances for in-stream modifications adjacent to private land.

The USDA's soil conservation requirements for cost share practices currently help to minimize soil erosion on participating farms. The required duration of practices, however, has typically resulted in repeated cycles in which funding for conservation practices have short-term cost share periods. As a result, the most beneficial practices receive the least amount of funding. Subsequently, sediment and associated farm chemicals continue to enter area waterways. Additional clearing of existing fragmented riparian forests, which are not protected by existing regulations, would exacerbate this problem by reducing sites for flood-water retention and ground water recharge and increasing the likelihood of stream bank erosion. In addition, population growth and the expansion of urban areas in the basin will subject increasing areas of soil to disturbance and development.

Under the No Action Alternative, USDA programs designed to conserve soil resources and restore and protect wetlands, programs such as the Conservation Reserve Program (CRP), Conservation Reserve Enhancement Program (CREP) and the Wetland Reserve Program (WRP), could still be initiated.

Participation, however, is not expected to increase significantly beyond what has been reported. The USDA's Stewardship and Forestry Incentive Programs are limited by funding. The ODNR's Nature Works Program, which is administered by the Division of Soil and Water, is limited by funding and participation. The established life of the initiative is due to expire unless new funding is authorized. New statewide conservation program funding has been proposed via the issuance of bonds. This is promising, however the funding has a limited duration. When used in conjunction with the Service's proposal, potentially significant resource conservation accomplishments could be achieved. The Conservation Reserve Enhancement Program could provide substantial protection through the purchase of easements, but it requires significant state cost sharing.

The USEPA-funded and OEPA-administered Clean Water Act Section 319 grants for work in the watershed have been more successfully implemented by the Madison Soil and Water Conservation District for filter strip establishment and other voluntary protective conservation practices in and near the project area than other Districts in the watershed. Their scale, participation rate, and funding levels generally are not extensive enough to have significant offsetting impact upon anticipated nonagricultural land use shifts. Within the past 5 years, approximately 16 miles of filter strips have been installed in a four-county area. None of these programs would likely have a significant effect on erosion or the conversion of productive soils resulting from low density housing and other developments of 5 acres or less. The Choctaw Lake residential development, located just southwest of the project boundary in the Deer Creek watershed, is a

good example of how large lot housing development has contributed to significant water contamination. The development is now under OEPA order to correct contamination from residential septic systems.

The groundwater pollution potential within the study area is greatest within the drainage corridors. Specifically, the most sensitive section is along the lower Spring Fork drainage (ODNR, 1987). Suitable and, to a lesser extent, prime residential development has been designated for these corridors and within primary aquifer protection areas according to the *1994 Madison County Comprehensive Land Use Plan* (Lockwood, Jones, and Beals, 1994). The recently adopted *Madison County Farmland Preservation Plan* has proposed to shift these near stream residential areas to other locations and reduce the overall amount of land designated for residential development. However, no rezoning actions have occurred as yet. Under the No Action alternative, increased development in the study area elevates the risk for ground water contamination and adjoining surface water degradation caused by septic systems and spills from the commercial sites.

4.1.2.2 Air Quality

Impacts to air quality under the No Action Alternative would be expected to remain the same or worsen as urban or rural development increases. Most of the negative impacts would be anticipated to be from increased automobile traffic and emissions. Depending upon the type of development, some degradation would also be expected to occur from the establishment of new industry.

4.1.2.3 Agricultural Land

In general, we would expect the No Action Alternative to result in a decrease in farmland over time in the watershed, primarily from increased human development and a corresponding decline in its contribution to the overall economy. In Madison and Union counties respectively, 7,000, and 11,000 acres of farmland were taken out of agricultural production between 1990 and 1997. During the 28-year period between 1970 and 1997, the same counties reported the conversion of 31,000, and 24,000 acres respectively from agriculture to other uses. Madison County witnessed a reduction of 17,000 acres of farmland between 1982 and 1997 (Ohio Agricultural Statistics Service, 1999), (The Ohio State University Extension Service, 1999). The rate of conversion was greatest for Union County during the 11-year period from 1987-1997. This is anticipated to continue, especially in the I-161 corridor east, west, and south of the Village of Plain City, located just northeast of the project area. In addition, the number of full-time farmers in Union County decreased by 23 percent (391-303) between 1982 and 1992 (*Union County Comprehensive Plan*, 1999). The number of residential structures in Union County increased by 2,110 between 1990 and 1996.

Madison County adopted a *Farmland Preservation Plan* and associated revised Comprehensive Land Use map in 1999. The *Farmland Preservation Plan* is part of an overall revised land use plan. The *Farmland Preservation Plan* is unique in that it provides a general assessment of issues and potential impacts to agriculture in the county and proposes a direction to protect agricultural lands. One major gap in the county plan, however, is that Monroe Township, which lies in the heart of the project area and which accounts for 14,500 acres, is not governed by any county zoning regulations. Generally, it is not the intention of the Service to critique the *Farmland Preservation Plan*, but only to review the document and consider the responses and plan direction in the context of the refuge proposal.

The issues analyzed by the *Farmland Preservation Plan* were articulated through the use of surveys directed at specific segments of Madison County residents and landowners. Surveys of absentee landowners, farmers, and the general community were conducted. Absentee landowners control approximately 25 percent of all farmland (65,000 acres, according to the *Farmland Preservation Plan*), however, only 48 percent of those surveyed responded. The rate of response by farmers was not much greater. Only 52 percent of farmers surveyed responded. Although public attitudes often tend to change according to conditions over time, the survey results provide some insight into the issue of development and farmland protection. The following questions and responses (*Madison County Farmland Preservation Plan*, 1999) in the plan are important to the refuge proposal.

Absentee Landowners' Responses

1. I would sell my farm for real estate development if it would bring a better price?
42% Agreed 33% Strongly Disagreed
2. Productive farm ground should be protected from loss due to non-agricultural development.
77% Agreed 10% Strongly Disagreed
3. I would accept monetary compensation in the amount of the difference between the appraised value of my land versus the agricultural value to keep my land in agriculture.
65% Agreed 16.7% Strongly Disagreed
4. I would donate my farm to a private foundation or public park district to keep my farm from being developed.
11.8% Agreed 50% Strongly Disagreed

The first two questions present an interesting contrast; one could assume that if both questions are considered in parallel, a majority might be interested in selling their land for development. At the very least there is ambivalence about the issue. Conversely, there appears to be strong interest in selling non-development easements by landowners.

Farmers' Responses

1. Should the county designate agricultural only areas that protect farms from residential development through restrictive zoning?
40.1% No 58.5% Yes
2. Would you be willing to accept monetary compensation in the amount of the difference between the appraised value and agricultural value to keep the land permanently agriculture?
31% No 63% Yes
3. Do you think that farming will be able to compete with development for land in the county without any restrictive zoning?
66% No 25% Yes

When taken together, both farmers and absentee landowners seem to include a strong minority (of half the respondents) that are not interested in land use controls to maintain farmland. It would have been clearer, however, if the phrase “restrictive zoning” used in Question 1 of the Farmer Survey was also used in Question 2 of the Absentee Landowner Survey. A better comparison of attitudes concerning this issue may have been assessed.

County Officials' Responses

1. Zoning to protect farmland should be a priority.

Public: 59% Strongly Agree / County Officials: 49.5% Strongly Agree

2. If more recreational and social activities were available, the county would be a better place to live.

Public: 25% Strongly Agree / County Officials: 6% Strongly Agree

3. We should protect the rural character of our county against shopping malls and parking lots.

Public: 50% Strongly Agree / County Officials: 40% Strongly Agree

The same general issues of “rural character” and “farmland protection” were not viewed by the county officials, overall, as clearly having the same level of importance as the farmers or absentee landowners assigned to them. This is important because this group represents the decision makers for the county. In assessing a collective vision for the county among both county officials and the public, 66 percent wanted the county to attract more business and 35 percent thought the county needed more houses.

The plan does state that on average, 78 percent of county officials and the public agreed that growth “sporadic” rural development should be controlled and zoning to protect farmland should be a priority. Nevertheless, the *Farmland Preservation Plan* points out that:

“Over the last 20 years, Madison County has lost 23,000 acres of farmland to urban development and other uses. In the last 5 years, the county has lost 1,891 acres to annexation into cities and villages. There has been an average of 100 houses placed on former farmland in unincorporated areas each year over the past 5 years.”

(Madison County Farmland Preservation Plan, 1999)

The *Farmland Preservation Plan* indicates that the rezonings will still be permitted for lot splits of 20 acres or less provided that they meet the approval of the Subdivision Review Board and comply with the county's comprehensive land use plan. These controls have been in place for the past 5 years when 100 houses per year have been built. Lot splits that are slightly above the 20-acre threshold, i.e. 20.01 acres, essentially are able to avoid the majority of the review process unless rezoning is sought.

Table 5 enumerates the number of new residences constructed in the refuge-affected townships in Madison County over the past 9 years.

Among the recommendations of the *Farmland Preservation Plan*, the pursuit of a Conditional Use zoning overlay on agricultural land for residential and

Table 5: New Residences Constructed in Madison County 1991-1999

Township	1991-94	1995-99	Percent Change
Canaan	67	76	+13%
Darby	24	20	- 17%
Deer Creek	14	13	- 7%
Monroe	37	47	+ 27%
Pike	3	11	+ 267%
Somerford	120	72	- 40%
Jefferson	55	61	+ 11%
Totals:	320 (80 units/year)	300 (60 units/year)	- 6%

Source: Madison County Building/Zoning Department

ag-related commercial and industrial uses is a catch-all category and will not likely affect the pace at which new housing has been constructed during the past 5 years. This recommendation has been suggested to avoid “spot zoning” of any subsequent 20-acre or less lot split that may be proposed in Watershed Conservation areas. In effect, it will continue to enable landowners to split off 20-acre or less parcels with road frontage for residential buildings. The plan also states that it will shorten the process for approving one or two-house sites on agricultural land.

Perhaps the most difficult recommendation before the county will be bringing current land use into conformance with the *Farmland Preservation Plan* through rezoning. Rezoning can be contentious, especially when changing classifications from high to low density use, such as residential to agricultural and commonly referred to as “down-zoning.”

The recommendation in the *Farmland Preservation Plan* opposing the Little Darby National Wildlife Refuge is incongruent with the discussion and logic supporting the *Farmland Preservation Plan*. Natural resource conservation programs are demonstrably more compatible with farmland preservation than the great majority of other land uses, especially residential development, whether it be from a succession of 20-acre lot splits or 200-acre subdivisions. Although the *Farmland Preservation Plan* states the reasons for this opposition, it is not supported with documentation. If established, the refuge would be compatible with county efforts to keep land in agriculture and to diversify and enhance the county’s tourism and service economies.

4.1.2.4 Drainage and Flood Control

Flooding frequency and duration would be expected to increase under the No Action Alternative. Hydrograph records maintained by the USGS for the watershed as a whole, including the project area, indicate some stability in flood regimes for the period of record (70 years). Anticipated pressure for growth in the two counties closest to the Columbus metropolitan area, Union and Madison counties, is expected to increase significantly according to county comprehensive plans. Madison County has demonstrated an interest in trying to subdue growth, more so than Union County, but pressures from the incorporated areas and the option to split 20-acre parcels will likely lead to more development. Subsequently, population growth, sedimentation, runoff, and urban development are all expected to increase significantly in the upper watershed and the project area.

Over time, these changes will increase flood peaks through additional storm water loading, contamination from septic systems, increase storm water facility maintenance, and potentially subject more property to damage at higher costs to the public.

4.2 Potential Impacts to the Biological Environment

This section considers the five alternatives' impact on biological diversity and abundance and wildlife disease. The discussion relates to biodiversity, threatened and endangered species, resident fish and wildlife species, and wildlife disease.

The section also discusses the potential effect upon the Little Darby Creek and Big Darby Creek National and State Scenic Rivers.

4.2.1 Alternatives 1-4 (Action)

4.2.1.1 Biological Diversity and Abundance

Implementation of any of the four Action alternatives would result in a range of restoration and preservation of biological diversity in the project area and upper Darby Creek Watershed, and it would benefit the lower reach of the Little Darby Creek and Big Darby Creek by combining long-term natural resource conservation and focused agricultural land use protection. Each alternative accomplishes this in varying degrees.

The proposed Refuge would significantly improve riparian habitat along the Little Darby Creek mainstem and on portions of various tributaries. In addition, wetland/grassland restoration would greatly improve the habitat for sensitive terrestrial and aquatic wildlife.

Alternatives 1-4 have several fee acquisition boundary elements in common:

- All four Action alternatives designate fee acquisition of tracts that straddle the near confluence of Little Darby Creek and Spring Fork tributary.
- Twelve to 18 miles of varying expansions of the Little Darby Creek are focused upon for fee acquisition.
- The lower Spring Fork tributary is considered as a fee area and proposed acquisition embraces 3-10 miles.



Watershed conservation is focused upon a larger area surrounding the designated voluntary fee boundary options illustrated by **Alternatives 2-4**. None of the Alternatives consider acquisition in Champaign or Clark counties. These alternatives have been compiled with the recognition that biodiversity and land use protection are not assured for the entire Little Darby or Big Darby Creek watersheds. Achieving that goal will depend on how many landowners implement conservation practices on their land, and it will also depend on several political subdivisions adopting committed, coordinated and cooperative land use planning initiatives that are supported by state legislative mandates. The role of state and local government and individual landowners would be even more important in Alternative 1, where no Watershed Conservation Area is proposed.

Alternative 1 primarily focuses on the protection and restoration of a broad range of resource values in the project area: riparian corridor of the Little Darby Creek and Lower Spring Fork, grasslands and wetland in the lower and upper drainage of the project area. This 24,735-acre Voluntary Purchase Area option focuses on a wide central corridor that offers integrated protection of substantial tributary reaches to the Little Darby Creek. The biological impact of this alternative, if implemented, would be to reconstruct a wetland/forested corridor from the confluence of Spring Fork with the Little Darby Creek north into Union County and west along Spring Fork, finally connecting to restored wet and mesic grassland systems. If implemented, this alternative could preserve existing riparian wetlands and restore historic riparian and nonriparian wetlands that provide important habitat for fish, amphibians, reptiles, and some mammals. This alternative includes 18 of 22 significant biological features (remnant prairie, mussel beds, etc.) within the original study area. Wetlands that fall within the designated fee acquisition areas identified for this alternative would also include palustrine emergent wetlands associated with hydric soils interspersed throughout an historic mesic tallgrass prairie area. Palustrine scrub-shrub wetlands and remnant oak savanna would be protected and restored where present. Alternative 1 would lead to increases in waterfowl and other migratory bird production and use in the designated areas by increasing the quantity and quality of nesting, resting, and feeding habitats. Of particular importance are area-sensitive wetland birds such as the American bittern, which requires large blocks of habitat, and those species previously discussed. It also allows for an enlarged restored mosaic of habitat along the main north-south corridor of the Little Darby Creek that in the long-term would be attractive to species such as osprey and bald eagles and would protect habitat for the endangered Indiana bat as well.

Alternative 1 would provide partial protection to drainages feeding the Little Darby Creek mainstem from the west, it affords no potentially greater watershed protection beyond the Voluntary Purchase Area boundary. Also, it eliminates the potential for any farmland protection in the lower Little Darby Creek drainage.

Alternative 2 (Preferred Alternative), compared to Alternative 1, focuses on restoration and protection of 4-6 miles of additional riparian corridor along the upper Little Darby Creek and Spring Fork, but also narrows the core boundary along the Little Darby Creek. This 22,783-acre Voluntary Purchase Area option reduces the voluntary acquisition area by 1,952 acres compared to Alternative 1. It is located principally along the central Little Darby Creek corridor. Alternative 2 expands native grassland, riparian and wetland habitat restoration and protection, predominantly in the upper Spring Fork drainage. Subsequently, it would potentially have a broader impact on those species that depend upon riparian habitat and would generally protect important in-stream aquatic resources. This alternative provides greater protection to in-stream aquatic habitat and sensitive mussel species. Alternative 2 includes 21 of 22 significant biological features within the original study area plus additional features in the Little Darby stream corridor in the Watershed Conservation Area southeast of the Voluntary Purchase Area. Grassland, wetland, and oak savanna ecosystem restoration would be focused largely in the lower Little Darby Creek drainage. Like Alternative 1, wetlands that fall within the designated fee acquisition areas identified for this alternative would also include palustrine emergent wetlands associated with hydric soils interspersed throughout an historic wet and mesic tallgrass prairie area. Palustrine scrub-shrub wetlands and remnant oak savanna

would be protected and restored where present. Careful reconstruction of the native prairie could help perpetuate the existence and diversity of rare native grassland ecosystems. Reestablishing large blocks of wet and mesic grassland habitat would benefit migratory birds, grassland adapted mammals, invertebrates, and some reptile and amphibian species.

Alternative 3 would focus primarily on protecting and restoring wetland and riparian habitat along the Little Darby Creek by expanding the designated fee acquisition boundary northwest into a large area of concentrated hydric soil and by restricting the voluntary acquisition boundary in the lower Little Darby Creek and Spring Fork drainage. This 20,772-acre Voluntary Purchase Area alternative limits restoration and protection of the Spring Fork drainage to the extreme lower reach near the confluence of the Little Darby Creek. The implementation and maintenance of conservation practices in the Watershed Conservation Area would have an important role in protecting a significant part of the Spring Fork drainage. This alternative includes 19 of 22 significant biological features within the original study area. Grassland, oak savanna, and wetland restoration would be primarily refocused to the contiguous tract in the north-central section of the project area. Projected grassland restoration areas could provide habitat for migrating Sandhill cranes, nongame migratory birds, and waterfowl on interspersed wetlands in this area and adjoining sites in the Little Darby Creek corridor.

Alternative 4 is similar to Alternative 2 in that it focuses on restoration and protection of 4-6 miles of additional riparian corridor along the upper Little Darby Creek. However, mid-upper reaches of Spring Fork are not considered for potentially the highest level of protection under the Voluntary Purchase Area. This 21,016-acre Voluntary Purchase Area option reduces the overall voluntary acquisition area by 3,719 acres compared to Alternative 1 and by 1,767 acres compared to Alternative 2. It is located principally along the central Little Darby Creek corridor. Alternative 4 provides the same potential level of native grassland, riparian and wetland habitat restoration and protection Spring Fork drainage as Alternative 1. The Alternative 4 Voluntary Purchase Area is equivalent to that of Alternative 2. Like Alternative 2, it would potentially have a broader impact on those species that depend upon riparian habitat in the Little Darby Creek mainstem and would generally protect important in-stream aquatic resources except for 4-6 miles in the mid-upper reach of the Spring Fork drainage.

This alternative, overall, provides less protection to in-stream aquatic habitat and sensitive mussel species than Alternative 2. Alternative 4 includes 19 of 22 significant biological features within the original study area but, like Alternative 2, includes additional features in the Little Darby stream corridor bounded by the Watershed Conservation Area southeast of the Voluntary Purchase Area. Alternative 4 constricts the Watershed Conservation Area to one-quarter mile on both sides of the primary drainages within the project area and excludes potential priority protection by either the Voluntary Purchase Area or the Watershed Conservation Area on a total of 12,221 acres. This area would be designated as a Private Initiative Conservation Area and would receive only private land cost share assistance from the Service.

This would reduce the potential protection within the combined Voluntary Purchase Area and Watershed Conservation Area to a total of 36,930 acres.

Grassland, wetland, and oak savanna ecosystem restoration under Alternative 4 would be focused largely in the lower Little Darby Creek drainage. Like Alternative 1, wetlands that fall within the designated fee acquisition areas identified for this alternative would also include palustrine emergent wetlands associated with hydric soils interspersed throughout an historic wet and mesic tallgrass prairie area. Palustrine scrub-shrub wetlands and remnant oak savanna would be protected and restored where present. Careful reconstruction of the native prairie could help perpetuate the existence and diversity of rare native grassland ecosystems. Reestablishing large blocks of wet and mesic grassland habitat would benefit migratory birds, grassland adapted mammals, invertebrates, and some reptile and amphibian species.

4.2.1.2 General Biological Discussion of Action Alternatives

Amphibians and wetland-dependent reptile species identified would benefit from the range of action alternatives but more from Alternatives 1 and 2 because they offer more connected wetlands. In addition to the restoration of wetlands and the various benefits they provide to numerous species, wetland restoration and riparian corridor emphasis would benefit several species of game and nongame migratory wetland birds of management concern. Of the 40 species listed as migratory bird Species of Management Concern by the U.S. Fish and Wildlife Service in Region 3, 16 would be positively affected by the proposed refuge. Twelve of the species listed as being of management concern by the Service are concurrently listed as regional priorities. (Appendix A).

The following species were identified through the Service's 1995 list of species of management concern, and through the Partners in Flight Region 3 Working Group, ODNr Priority List, and Ohio Threatened and Endangered Species List. In the following list, "*" denotes Ohio-listed threatened and endangered listing/reference and "+" denotes Federal-listed threatened and endangered listing/reference.

American bittern*	Least bittern*
Red-shouldered hawk*	American woodcock
Wood duck	American Black duck*
Mallard	Blue-winged teal
Bald eagle*+	Sedge wren*
Northern harrier*	Osprey*
Sandhill crane*	Northern pintail

All alternatives will enhance the protection of management-concern grassland birds. The following list includes species from the Service's 1995 list, and those identified through the Ohio River Valley Ecosystem Team (ORVE), Partners in Flight Working Group, and the Ohio Division of Wildlife's threatened and endangered species list.

Loggerhead shrike*	Dickcissel
Field sparrow	Henslow's sparrow*
Grasshopper sparrow	Vesper sparrow
Bobolink	Golden-winged warbler*
Savannah sparrow	Eastern meadowlark
Upland sandpiper*	

Of these declining and management-concern species, northern harrier, bobolink, upland sandpiper, savannah sparrow, and Henslow's sparrow are classified as

having high sensitivity to habitat fragmentation (highly area sensitive). The eastern meadowlark and grasshopper sparrow are classified as having moderate sensitivity to habitat fragmentation (Herkert et al., 1993). Generally, the restoration of wetland and grassland complexes containing large, interconnected habitat patches would provide habitat for a variety of area and regionally sensitive wetland/grassland-dependent nongame migratory birds.

Ohio-listed threatened and endangered, potentially threatened, and special interest plant species that will be affected by alternatives are as follows:

Lake cress	Bicknell's sedge
Sartwell's sedge	Reflexed sedge
Grape honeysuckle	Prairie dropseed

Alternative 1 includes large areas west of State Route 38 and Alternative 3 includes large areas west of State Route 38 and north of Rosedale-Finley Guy Road. In these areas, the restoration of large, native grassland blocks (250 acres and larger), and the management of the surrounding landscape (pasture and other non-forested habitat) will establish a favorable landscape for area-sensitive grassland birds in addition to the tracts in the lower Spring Fork drainage. Components of Alternative 1 and Alternative 3 that will protect and restore habitat for grassland nesting migratory birds will likely also provide suitable habitat for grassland mammals, reptiles and amphibians whose distribution coincides with a larger segment of the original Darby Plains region. Moreover, Alternative 1 and Alternative 3 would attempt to restore the links between the historic wetland, prairie, and oak savanna ecosystems on a wider scale.

Overall, it was assumed that if land that contains or is restored to benefit a state-listed species were protected under the proposed refuge, then that state-listed species would receive a measure of protection from the refuge. Based upon a generally accepted natural resource management principal, it was also assumed that aquatic species downstream from the refuge would benefit from improvements in and maintenance of water quality. The following is a partial list of state-listed species that would potentially benefit:

Indiana bat	American bittern
Least Bittern	Bald eagle
Northern harrier	Sandhill crane
Sedge wren	Loggerhead shrike
Golden-winged warbler	Osprey
Upland sandpiper	Northern riffleshell
Eastern hellbender	Tippecanoe darter
Bluebreast darter	Snuffbox
Rayed bean	Elephant-ear
Clubshell	Rabbitsfoot
Lake-cress	

All Action alternatives provide potential core habitat protection and restoration opportunities to a range of migratory birds and in-stream aquatic resources through grassland, wetland, and riparian-woodland habitats. Conservation and restoration activities on the proposed refuge, (e.g., reduction of pollutants and sediments from Darby lands; conservation and restoration of stream bed habitat; and elimination of point sources of pollution) will benefit the mussels and their fish hosts both in the refuge and throughout the Darby ecosystem. The same concept is true for migratory bird species. Fragmented grassland and riparian

habitat is considered to be one of the primary reasons for declines in many migratory birds. However, watershed or significant sub-watershed protection (including wetland restoration) is an essential element of protecting in-stream aquatic habitat by ensuring that water quality is maintained or impacts mitigated. Alternatives 2-4 incorporate large watershed-wide aquatic and terrestrial habitat considerations that form the basis of a sound biodiversity restoration and protection plan.

a) Potential Effect upon the Little Darby and Big Darby Creek National and State Scenic River Status

The natural resource conservation practices and fish and wildlife habitat restoration strategies discussed throughout this proposal will undoubtedly contribute to the long-term value, status and aquatic resource protection of the portions of the Little Darby Creek and Big Darby Creek designated as national and state scenic rivers. Direct benefits in the form of habitat protection and restoration, improvements in water quality and associated wildlife population benefits will ensue to a greater extent in the proposed refuge area and, to a lesser extent, down stream from the project area.

4.2.1.3 Wildlife Disease

The proposed establishment of the Little Darby National Wildlife Refuge should not lead to any increase in the incidence of wildlife disease either among humans, domestic animals, or wildlife. The primary wildlife-related disease issues can be identified as:

- The incidence of disease transmission among wildlife populations and domestic animals.
- The potential for transmission of wildlife diseases to the human population.

Habitat quality is a significant factor in maintaining healthy wildlife populations. Many associated diseases are normally present at low levels and some populations are reservoirs of causative bacteria and viruses. However, these may not affect the general health of a species or a group of related species unless a population is exposed to conditions that place it under stress, such as unusual climatic events combined with limited or poor quality habitat.

While the interaction of some wildlife species with domestic animals may occur, significant disease transmission levels are still low. Conversely, sanitary husbandry practices for domestic livestock may be equally suspect in disease transmission among wildlife and human populations. For example, the practice of allowing livestock to have unrestricted access to free flowing streams for watering is clearly not a sanitary practice that is recommended by domestic animal and wildlife veterinarians.

According to the Ohio Department of Health, there are three types of mosquito-borne encephalitis in Ohio:

- La Crosse encephalitis
- St. Louis encephalitis
- Eastern equine encephalitis

Widely scattered cases of La Crosse encephalitis are found in Ohio every year and are associated with wood lots and forests, where the treehole mosquito

breeds. This mosquito will also breed in tires, buckets, and other water-holding containers, but not pools of water in ground depressions. It is not associated with flooding, due to its breeding habitat. The proposed Little Darby National Wildlife Refuge focus is primarily upon restoration of native habitats such as the stream side habitats, grasslands, and wetlands. These habitats are not likely to function as breeding habitat for the treehole mosquito. The Service would actively work to cleanup any debris such as tires and cans on the refuge that could serve as breeding habitat.

St. Louis encephalitis is associated with dry conditions, when small streams dry into pools which are stagnant and often polluted with organic material, such as from a septic tank. Thus, this disease is not associated with flooding, but may be a problem afterward if a long dry period follows the flood and water stands stagnant and polluted for a long time. The wetland restoration that the Service would do associated with the Little Darby Refuge would contribute to ground water recharge, helping to maintain the discharge from springs that contribute to the flows in the local streams, making it less likely that the small streams in the area would dry up into mosquito breeding pools. Also, any wetlands restored would include vegetation buffer areas around them, ensuring that they are not polluted by organic material from off-site runoff. Both of these situations would reduce the likelihood of the Refuge aggravating this disease problem.

Eastern equine encephalitis (EEE) is so named because it is an important killer of horses in the eastern U.S. It is associated with acid bogs and cattail marshes. The acid bog is essential, because the bog mosquito, which maintains the virus in nature, only breeds in acid bogs. Other mosquitoes from nearby cattail marshes spread the virus from birds to horses and people. This disease is not associated with flooding unless high water levels are maintained for a long period of time, allowing the vector mosquito populations to build. Thus, high water levels in one year may lead to an outbreak of EEE in the next year. Ohio has only one recorded outbreak of EEE, during 1991. Acid bogs are not the type of wetlands that would be restored in the Little Darby project area. Much of the wetland restoration work would likely involve wet prairie which would not provide habitat for this mosquito.

It is not likely that the Little Darby National Wildlife Refuge would create disease problems associated with mosquitos. In addition to the proposed Little Darby Refuge not providing good habitat for many of the disease related mosquitos, the use of the refuge areas by natural mosquito predators such as bats, birds, and dragonflies also helps to reduce mosquito problems. There are over 500 national wildlife refuges nationwide, many located adjacent to or within large human population areas. Mosquitos as disease vectors or pests are not significant issues commonly raised by residents adjacent to these established wildlife refuges.

The Service commitment is to human health as the overriding concern when it comes to the issue of mosquito control on Refuges. This ensures that the Little Darby National Wildlife Refuge would not be an impediment to any necessary mosquito control when there is a demonstrated human health threat.

In an attempt to evaluate the potential for greater disease transmission from wildlife populations due to the proposed Refuge, the Service asked staff at the U.S. Geological Survey, Biological Resources Division, National Wildlife Health Center (NWHC) to review the letter submitted by the Madison County Health

Commissioner dated January 19, 2000 (see letter number 798A-L in Appendix M) concerning specific viral and bacterial diseases. According to the NWHC, (see letter number 799A-C in Appendix M), most of the diseases identified in the Commissioner's letter do not have impacts upon human populations in any significant way or have only regional importance. Responding to the Commissioner's claim of increased disease spread due to the creation of "wetlands, swamps, and woody grassy areas," the NWHC staff responded "I am not aware of any published literature, data, or speculation that would substantiate this claim."

Service employees have been interacting with wildlife populations and wildlife disease outbreaks and issues for almost 100 years on national wildlife refuges. Healthy wildlife populations are recognized as being in balance with their habitat. In the absence of natural predators, hunting and trapping have been used on national wildlife refuges when necessary to consistently keep populations in balance with their habitat. Furthermore, thousands of Service employees work on national wildlife refuges nationwide with no unusual incidences of contracting diseases that have been identified by the Madison County Health Commissioner. It would be reasonable to presume that Service employees who are in close contact with wetlands, grasslands, and woodlands on a daily basis would be affected if these diseases were as widespread on wild lands as indicated.

Rabies is one of the more important diseases identified. The Service has long known that rabies is more prevalent among several species of wild mammals. It is interesting to note that within the past 10 years in Ohio, bats (not raccoons and skunks) have been the predominant animal suspect in the transmission of rabies and its variants. From this geographic record, these incidents appear to be associated with more urban areas. In addition, within most areas of the United States, rabies infections of terrestrial animals occur in geographically discrete regions where virus transmission is primarily between members of the same species. Spillover infection from these species to other animal species may occur in a region, but such instances are sporadic and rarely initiate sustained intraspecific transmission (Krebs, Smith, Rupprecht, and Childs, 1999).

Lyme disease is of concern to the Service as well as to Madison County officials. Since 1984, 529 cases of Lyme Disease have been reported in Ohio. Approximately 50 percent of the cases reported can be traced to transmission from outside of the state. The specific tick responsible for its transmission is not endemic to Ohio nor is it established in the state (Ohio Department of Health, 1998).

Overall, based upon the review by the NWHC and the Service's experience with wildlife diseases throughout the Refuge System, we would not anticipate any greater prevalence of wildlife and associated human disease to occur from the proposed establishment of the Little Darby National Wildlife Refuge than what already exists in the area.

4.2.2 Alternative 5 (No Action)

4.2.2.1 Biological Diversity and Abundance

Under this alternative we anticipate that the Little Darby Creek in-stream biological diversity, as well as the quantity and quality of adjoining wetlands and riparian forests, would continue to decline in the project area. The historic Darby Plains had extensive wetland, grassland and oak savanna resources dispersed

over more than 100,000 acres. Under Alternative 5, some wetland restoration and preservation could continue by other Federal programs such as the Wetland Reserve Program and by state and local efforts. However, wetland/riparian habitat restoration and protection would not likely be significant and would probably be jeopardized by increasing development within and outside of the corridor. However, efforts to date by the Natural Resources Conservation Service to implement their conservation programs in the project area have been largely met with apathy or lands have not qualified for the programs.

The maintenance of agriculture within the watershed is important and also constitutes a significant compatible land use. Agriculture and associated cost shared conservation practices alone, however, will not be able to restore and protect Federal trust resources within a rapidly growing metropolitan environment without substantially strengthened land use planning authority from the state. The general recognition of private property rights preeminence will likely compromise land use plans in the long-term. Fragmented riparian forest and in-stream habitat will continue to receive limited protection from existing local regulatory processes, as well as currently weakened Federal Clean Water Act rules. The current water quality and wildlife habitat benefits associated with these areas would be lost.

Alternative 5 would result in no direct change in waterfowl habitat or use since there would not be an appreciable increase of resting or feeding habitats in the immediate area, nor would the quality of existing habitats improve appreciably. In the long-term, local waterfowl populations could further decline as existing small upland and near stream wetland habitats throughout the project area are disturbed or degraded as a direct or indirect result of increasing population pressures.

Although communication among the conservation organizations and agencies has been more organized and, to a lesser extent, coordinated in the watershed in the past 10 years, the extensive application of long-term conservation practices and legally authoritative protection measures by any political subdivision has not been uniformly evident. This is anticipated to continue. Ultimately, the No Action Alternative will result in less efficient, more competitive, and inadequately funded conservation of biodiversity. Opportunities to work at the landscape scale in the watershed will decline rapidly as development progresses in the present institutional environment that does not provide adequate resource protection, nor has the acceptance by land users of existing conservation programs. Many of the threats in the form of non-urban land use conversions in the watershed have been realized over the past 100 years. Opportunities to establish effective areas that connect, restore and protect a naturally historic ecosystem are disappearing as the watershed and general project area urbanizes.

Alternative 5 would also result in protection of grassland migratory birds remaining limited. Some recent efforts by The Nature Conservancy, Franklin County Metropolitan Park District, and NRCS through CRP and WRP will have a positive limited impact as will continued efforts by the ODNR. However, in terms of grassland migratory bird and other species associated with oak savanna and wet prairie, this alternative would likely result in continued decline for many species as well as the ecosystem. Restoration and preservation of Federal and state-listed species would remain marginal under existing laws and regulations in Alternative 5, but would ultimately be compromised and jeopardized by contin-

ued urbanization. In addition, this alternative would not focus Service restoration and habitat management activities to benefit both Federal and state-listed species.

Overall, the long-term impact of this alternative, based upon past participation in various conservation programs, would result in there being no significant, widely applied and long-term conservation initiative that would benefit migratory birds, threatened or endangered species or that would contribute substantially to preservation or restoration of biodiversity in the watershed.

4.3 Potential Impacts to the Socioeconomic Environment

This section examines the alternatives in relation to the broad topics of economic impacts, Service land acquisition and funding, property taxes, revenue sharing and apportionment, relocation benefits, private property rights, cultural resources, public use, school district revenue and community involvement.

4.3.1 Economic Impacts

The potential socioeconomic impacts of both the No Action Alternative and the four Action Alternatives are discussed in the Economic Impact Assessment of the Proposed Little Darby National Wildlife Refuge (Appendix H). The potential impacts outlined in the economic analysis for the range of alternatives presented has been determined to be minimal or neutral. Recent analyses of impacts to school districts and changes to county revenue from potential effects upon improved property valuation were also found to be minimal over the life of the project.

The economic study area of Madison and Union counties is a region in transition. Historically, it has been a farming area specializing in corn, soybeans, and wheat. Madison County is often in the top 10 corn or soybean producing counties in Ohio. More recently, however, the trend is away from agriculture toward suburban development. Columbus has expanded, bringing work sites within easy commuting distance. The towns of London and Plain City are expanding as well. Union County has developed a significant industry bringing manufacturing jobs into the rural landscape. In 1990, 40 percent of Madison County workers worked outside of the county. As population growth in the study area has averaged 1 percent per year largely from in-migration, this trend to commuting is likely to continue. The No Action Alternative reflects anticipated residential development in the proposed refuge area.

Standard input/output techniques were used to estimate the regional economic impacts per acre of agricultural, residential, and refuge land uses. Projections of population growth in the study area and information about preferred areas for rural residential development lead to estimates of the area each type of land use would cover with and without the Little Darby National Wildlife Refuge. These projections are based on the *1994 Madison County Comprehensive Plan*. Madison County recently adopted a *Farmland Preservation Plan*. At the time that this Draft Environmental Impact Statement was being prepared, it was not clear what the final provisions of the *Comprehensive Plan* and *Farmland Preservation Plan* would be, thus anticipated future conditions under both the *1994 Comprehensive Plan* and the revised *Comprehensive Plan* (including the *Farmland Preservation Plan*) were used to estimate the regional economic impacts of refuge development.

The analysis showed that when it is fully implemented in 30 years under the *1994 Madison County Comprehensive Plan* scenario, the refuge's Voluntary Purchase Area and its operation and associated recreation and cooperative agriculture would provide 73 percent as many jobs and about 65 percent as much spending as the existing farmland. Service industries would increase output with a refuge while agricultural services and trade would experience a decrease in spending. Similarly, under the *Madison County Farmland Preservation Plan* scenario, refuge operations, recreation and agriculture would provide about 68 percent as many jobs and 61 percent as much income as existing farmland. The trade-offs between agriculture and wildlife habitat are overshadowed by the impact of residential development displaced by the refuge. The largest refuge Voluntary Purchase Area considered may displace 74 agricultural jobs but it will create 54 jobs related to refuge operations and recreation. Residential development of the same area would have created 503 jobs. Residential development would greatly change the character of the study area as well as its economy.

The major objective of the *Madison County Farmland Preservation Plan* is to protect agricultural lands, however under the current provisions of the *Farm-land Preservation Plan* development is still possible. It is not known with any certainty how much land may actually be developed. For the purposes of this analysis, it is conservatively assumed that future development will be similar to what has actually been constructed in the area during the past 9 years (Madison County, 2000).

Although it would increase overall economic activity, residential development also imposes more costs on the community. Among the largest of these is the cost of educating new resident children. Anticipated taxes on new housing barely cover the cost of schooling, leaving little to help with other public services or infrastructure. Revenue sharing from the Little Darby National Wildlife Refuge, on the other hand, compares favorably with the Current Agricultural Use Value (CAUV) tax proceeds from agricultural land. Plus, refuges place few demands on county services.

All of the changes discussed will be phased in over 30 years. There will be ample time for residents to adapt to the changing environment. Ironically, if the project is successful, residents will notice that other areas of the region are changing dramatically while the project area remains the same or turns back into natural vegetation. Residential development that would have occurred in the area will be displaced to other areas, possibly in the two study area counties. The changes predicted are within the normal variation for agricultural and recreational industries and are likely to be imperceptible against the broader trends in the national economy.

Regional impacts are important for local interest groups. On a national scale, however, they represent only shifts in spending and income from one area of the country to another. Recreational spending, for example, would have occurred elsewhere if not at Little Darby. To evaluate the effect of the project on national well-being, we need to estimate the benefits or "net economic value" produced by each alternative. All of the refuge alternatives produce national benefits of at least \$1.5 million annually. Conversion of land to refuge use provides more benefits than any of the other options by contributing to the recreational opportunities in central Ohio. In addition to the recreational benefits, unquantified ecosystem and endangered species benefits could double the estimated level of benefits.

The project area is a small proportion of farmland in the Columbus area. The largest acquisition alternative would encompass 5.2 percent of the farmland area of Madison and Union counties when it is complete. This is slightly over half the loss of farmland that has occurred in Madison and Union counties from 1982 to 1997. Project activities will have no effect on agricultural land values and little effect on the value of land for other uses. The refuge does not change landowners' economic opportunities significantly.

Ohio's Current Agricultural Use Value (CAUV) program allows agricultural land to be appraised for tax purposes by soil type rather than by full market value. The program is intended to preserve farmland by eliminating the escalation in taxes as the value of the land for alternative uses increases. In 1997, for example, the taxable value of 269,391 acres in Madison County would have been \$122 million in other uses but was \$41 million under agricultural use valuation (Ohio Department of Taxation).

National wildlife refuges are not subject to local property taxes because they are Federal lands. To mitigate the impact of this exemption on local tax collections, Congress has established the Refuge Revenue Sharing program (RRS), which distributes revenues from refuge resource use and a Federal appropriation to refuge host communities. The payment is usually three-quarters of 1 percent (0.75 percent) of the fair market value of refuge lands in their highest and best use, prorated to the extent of available funds. In recent years, payments have been prorated to 60 to 90 percent of the calculated payment due. Refuge revenue sharing payments are estimated in the economic analysis by applying the 0.75 percent rate to the market value of land of each soil type and pro-rating the amount by the average level of funds available in recent years, 70 percent. The exhibit shows that refuge revenue sharing payments, even assuming that only 70 percent of the full entitlement payment is made, are greater than the CAUV proceeds from the land in each refuge option at prevailing assessments and tax rates in the local area.

Under Alternative 5 (No Action), conversion of agricultural land to residential development and related industries would likely continue. Residential development is a plus for local economies during the construction but in general, residential property costs communities more to support than the taxes they generate, due to the cost of providing schools and other infrastructure and services.

4.3.2 Service Land Acquisition and Funding

4.3.2.1 General

Under Alternative 2, the preferred alternative, Service land acquisition from willing sellers could potentially involve approximately 22,000 acres of fee simple and 26,000 acres of easement purchases over the next 30 years. In reality, fee title acquisition in the Voluntary Purchase Area would more than likely be less than 22,000 acres when all residential villages, towns, and commercial development are discounted. These acquisitions could involve a range of conservation easements, cooperative agreements, fee-title purchases, leases, or a combination of all methods, depending on the site and circumstances. All lands acquired by the Service would be administered and managed in accordance with the mandates that govern the administration of the National Wildlife Refuge System. Tracts in which less than fee-title agreements are negotiated would remain in private ownership. All restoration and preservation would be carried out on a tract-by-tract basis as participants and funds become available over an unspecified time period (willing buyer/willing seller basis).

The total estimated cost of implementing the project in the Voluntary Purchase Area ranges from \$40 to \$70 million (current dollars) over 30 years. The estimate for the Watershed Conservation Area is \$20 to \$40 million over the same period.

Funding for land acquisition would come from the Land and Water Conservation Fund using the authority of the Fish and Wildlife Act. Private funding, if made available, may be used to acquire a realty interest in lands as well. Lands could also be acquired through exchanges and donations.

Regarding Acquisitions using the Land and Water Conservation Fund, Congressional Appropriation Committees have established concurrence requirements that affect the cost of acquisitions and eminent domain authority. For example:

Conferee's Report of 9/29/79, Amendment No. 13 states:

The managers agree that for recreation additions the Fish and Wildlife Service should submit proposed acquisitions in excess of \$150,000 or any declaration of taking for prior approval of the Appropriations Committees as recommended by the Senate.

Senate Report No. 96-363, page 19, 96th Congress, 1st Session:

Fish and Wildlife Service.....The Service should continue to submit individual purchase proposals for recreation and conservation additions for prior review and approval by the House and Senate Appropriations Committees.

In addition, House Report 105-609 from the Interior Appropriations Subcommittee to the full Appropriations Committee directed the Service to proceed on this project as follows:

.....to cooperate with traditional agriculture interests in the area and minimize the long term loss or transition of agricultural land to other uses. Acquisition would be on a willing seller or donor basis and will not include the use of eminent domain unless requested by the property owner to determine land value.....

It is Service policy to acquire the minimum interest necessary to reach project goals and objectives. Full consideration would be given to extended use reservations, exchanges, or other alternatives that would lessen the impact on the landowners and the community. Acquisition of lands would be from willing sellers only, and only lands in which a realty interest is acquired would become part of the proposed Refuge. If the acquisition of only a portion of a property would leave the landowner with an uneconomic remnant, such as a small parcel of land cut off by a road that forms the Voluntary Purchase Area boundary, the Service would offer to acquire the uneconomic remnant along with the portion of the property needed for the project. Written offers to willing sellers will be based on a professional appraisal of the property using recent sales of comparable properties in the area. Landowners will have the final decision on whether to accept or reject a Service offer. Service priorities for acquisition of fee title and easements within the project area are discussed in Appendix K.

Acquisition procedures of other agencies and private conservation organizations often follow the aforementioned procedures, although their standards may differ

from those of the Service. Some groups may have more latitude as to the price offered for a particular tract of land. The Service must pay fair market value and has very little latitude in going above that value. Fair market value is determined by means of an appraisal of the current market value of similar properties in the same area. The Service's offer to purchase a specific tract based upon the fair market value cannot be less than the going rate for similar property, nor can it be more than the going rate for similar property. Since acquisition under Alternatives 1-4 would be from willing sellers who would be paid market value, acquisition procedures would have little or no impact on landowners who choose not to sell.

a) Real Property Appraisal (FWS Appraisal Handbook)

It is Service policy that all appraisals are to be made by qualified, competent appraisers and reviewed and approved by qualified reviewers before the respective value estimates are used by the Service at large.

Service appraisals will be conducted and reports prepared in accordance with policy and generally accepted techniques and practices advocated by the appraisal profession, and in conformity with the Uniform Appraisal Standards for Federal Land Acquisitions and the Uniform Standards of Professional Appraisal Practice. Service real property appraisal policy and guidance can be found in the Division of Realty Appraisal Handbook, (342 FW 1), August 1993.

Concerning appraisals to determine Refuge Revenue Sharing payments, it is important to mention several points.

1) Appraisals are based upon the highest and best use that is legally permissible. Several important considerations are taken into account.

- Existing zoning
- Uses of comparables and/or adjacent lands
- Uses that most probably would now prevail if project lands had remained in private ownership.
- Other Federal and state land use restrictions that would prevail.

2) Important assumptions regarding improvements include:

- Structural improvements made subsequent to Federal acquisition are excluded.
- Structural improvements that have been subject to extensive renovation-remodeling subsequent to Federal acquisition are excluded if over 75 percent of value is in renovation.
- Major land improvements such as irrigation facilities, dikes, drainage ditches, fill and grade work, roads, etc., that normally would have been installed by private owners had the property not been developed for Federal purposes are included.

4.3.2.2 Designated Voluntary Purchase Area Tracts – Alternatives 1-4

Although these tracts are preferred to be acquired in fee simple, less than fee simple acquisition options will be considered provided that management objectives can be achieved. Once the land is acquired by the Service, the continuance

Table 6: Forms of Acquisition Used by the U.S. Fish & Wildlife Service

Fee Title	Voluntary acquisition of all land ownership rights.
Conservation Easements (Including purchase of development rights.)	The acquisition of part of the land ownership rights from willing property owners. Usually perpetual.
Jurisdictional Transfer	The transfer of management from one Federal agency to another.
Cooperative Agreement	Voluntary agreements with landowners to accomplish specific management objectives.
Lease	Specified term rental of land for management. Usually involves some specified periodic payment to the landowner.
Donation	Voluntary gift of land or interest in land without monetary reimbursement.

of private uses of land, such as farming, will be considered on a short-term lease basis (2-3 years) if there is a management benefit to doing so or until funding is sufficient to restore and manage habitat.

4.3.2.3 Watershed Conservation Area – Alternatives 2-4

It is in the Service's interest to have the area designated as Watershed Conservation and remain in agriculture. To achieve this objective, the Service has established a project boundary that will allow it to:

- Use purchase of development rights under the agency's easement authority. Fee simple acquisition would be considered if that is the landowner's preference.
- Facilitate the purchase of development rights by private organizations and other public agencies.
- Accept donations of land into the refuge system and manage lands by lease or cooperative agreement with private or public entities.
- Facilitate broader use of conservation practices in the watershed.

The Service is proposing to use, to the extent possible, the language from the draft farmland preservation easement developed by the Ohio Department of Agriculture (ODA). The Service will also propose to enter into a cooperative agreement with the ODA farmland preservation office to coordinate implementation of the PDR program in the Watershed Conservation Area. Possible draft easement language is included in Appendix L. The language may be customized to an extent to meet the landowners' interest and the Service's objectives. All non-development easements will be perpetual.

Any Service easement program in the project area will be administered in close cooperation with other organizations and state agencies. Table 6 describes some of the types of acquisition the Service can use. A more detailed description of each mechanism follows.

Conservation Easements involve the voluntary acquisition of certain rights that can be of value for the purpose of achieving fish and wildlife habitat objectives. They usually control or encourage certain practices, for example the right to drain a wetland or delay haying harvest. Easements become part of the title to

the property and are usually permanent. If a landowner sells the property, the easement continues as part of the title. Conservation easements can be customized to achieve the interests of both parties and can affect any particular land ownership right.

Lease Agreements are voluntary specified term agreements for full or specified use of the land in return for an annual rental payment that generally includes occupancy rights. For example, a landowner could lease several acres of grassland habitat to the Service for the provision of safe nesting for ground nesting birds. The landowner would not be able to hay or otherwise disturb the ground during the lease period.

Cooperative Agreements are negotiated between the Service and other government agencies, conservation groups, or individuals. A voluntary agreement such as this usually specifies a particular management action or activity the landowner will do, or not do, on his or her property for some reciprocal consideration by the Service. For example, a simple agreement would be for the landowner to agree to delay hayland mowing until after a certain date to allow ground nesting birds to hatch their young. More comprehensive agreements are possible for such things as wetland or upland restoration, or public access. Agreements can be strictly voluntary on the part of the landowner or involve some form of consideration. As long as a landowner abides by the terms of the agreement, this protection can be effective in meeting certain refuge objectives.

Fee-simple acquisition involves voluntary acquisition of most or all of the rights to a unit of land. There is a total transfer of property with the formal conveyance of a title to the Federal government. While fee acquisition involves most of the rights to a property, certain rights may be withheld or not purchased, such as water rights, mineral rights, and use reservations such as residential use.

4.3.2.4 Land Ownership and Operational Funding

During scoping meetings, some people expressed concern that the Federal government already owns too much land. Some felt that sufficient natural areas are already protected in Ohio. Considering the areas managed by the principle Federal land management agencies, namely the Bureau of Land Management, the National Park Service, the Forest Service, and the Fish and Wildlife Service, there are 668.1 million acres in Federal ownership (National Wilderness Institute, 1995). This is 30 percent of the total U.S. land area. However, 36 percent of that Federal ownership is in Alaska alone, and significant areas of the balance are located in the western United States where the land never was in private ownership.

In Ohio, 2.6 percent of the land is federally owned. Combining Federal and State holdings, 4.2 percent of the land in Ohio is publically held. The U.S. Fish and Wildlife Service owns .03 percent (three hundredths of 1 percent) of the land in the state, or 8,353 acres. According to the National Wilderness Institute figures, Ohio ranks 45th nationally in the total amount of Federal and State owned land. Based upon these figures, public ownership of land in Ohio does not appear to be excessive.

Some individuals have also questioned why the Service would seek to acquire more land when a maintenance funding backlog has been identified on existing national wildlife refuges. The existence of funding needs does not eliminate the

need to preserve and restore habitat for Federal trust species. Threatened and endangered species and other species in decline, such as many of the grassland-dependent birds, can not wait until maintenance funding is increased. They need habitat and increased protection now. Many areas like the Little Darby Creek Watershed will not be available for preservation in another 25 or 30 years. Development, urbanization, and environmental deterioration are taking their toll in many parts of the country.

The Service has compensated to some degree for shortages in operational funding by using volunteers to assist with all aspects of refuge operations. Literally thousands of hours of assistance are provided each year by volunteers. This benefits the refuge system as well as makes the volunteers intimately aware of and involved in refuge operations. Refuge managers are also very good at running operations efficiently and cost effectively.

Operational funding for national wildlife refuges comes from appropriated funds derived from tax receipts. Efforts are under way in Congress to address operational funding shortfalls. For example, some are seeking to provide funds to address maintenance backlogs from revenue derived from the sale of oil and gas from Federal lands. While these efforts proceed, we need to continue work to ensure that sufficient quality habitat exists for all species.

4.3.3 Relocation Benefits

The uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (Uniform Act) provides for certain relocation benefits to home owners, businesses, and farm operators who choose to sell and relocate as a result of Federal acquisition. The law provides for benefits to eligible owners and tenants in the following areas:

- Reimbursement of reasonable moving and related expenses;
- Replacement housing payments under certain conditions;
- Relocation assistance services to help locate replacement housing, farm, or business properties;
- Reimbursement of certain necessary and reasonable expenses incurred in selling real property to the government.

It must be noted that the Service primarily avoids the acquisition of buildings and structures unless there is a management reason to acquire them or the landowner is only interested in selling the land and the buildings together. Concentrated residential areas such as villages and commercial developments will not be affected.

4.3.4 Property Taxes and Refuge Revenue Sharing Payments and Apportionment

The Refuge Revenue Sharing Act of June 15, 1935, as amended, provides for annual payments to counties or the lowest unit of government that collects and distributes taxes based on acreage and value of National Wildlife Refuge lands located within the county. The monies for these payments come from two sources: (1) net receipts from the sale of products from Federal lands (oil and gas leases, timber sales, grazing fees, etc.) and (2) annual Congressional appropriations. Annual Congressional appropriations, as authorized by a 1978 amendment,

were intended to make up the difference between the net receipts from the Refuge Revenue Sharing Fund and the total amount due to local units of government. The actual Refuge Revenue Sharing Fund payment made averaged 80 percent of full entitlement for the 26-year period from 1972 to 1997.

Payments to the counties are calculated based on the following formulas as set out in the Act which provides the largest return:

- \$.75 per acre;
- 25 percent of the net receipts collected from refuge lands in the county; or
- Three-quarters of 1 percent of the appraised fair market value. In Ohio, three-quarters of 1 percent of the appraised value almost always brings the greatest return to the taxing bodies. Using this method, lands are reappraised every 5 years to reflect current market values for the highest and best use. In November and December of 1994, the Service canvassed all 141 counties in the eight-state area of Region 3 where refuge revenue sharing payments are made on National Wildlife Refuge System lands. The counties were asked to estimate the real estate taxes on these lands had they remained in private ownership. In Ohio, full revenue sharing payments would have been 111 percent of taxes at that time.

In comparing the projected refuge revenue sharing payments with current tax revenue from agricultural lands in each alternative, the Service used the 1999 CAUVs and applied the 1999 tax rates from Madison and Union counties to estimate current tax revenue. Under the Preferred Alternative, it is estimated that the Refuge Revenue Sharing Payment for Madison County would be \$111,000. The County's current agricultural use value (also under the preferred alternative) ranges from \$88,000 to \$110,000.

In Union County, it is estimated that the Refuge Revenue Sharing payment would be \$29,000 under the preferred alternative. The current agricultural use value (also under the preferred alternative) now ranges from \$22,000 to \$28,000.

The revenue sharing estimates for Madison and Union counties were calculated assuming a 70 percent Refuge Revenue Sharing funding level.

According to the Refuge Revenue Sharing Act, which authorizes the Service to make these payments:

“Each county which receives payments....shall distribute, under guidelines established by the Secretary, such payments on a proportional basis to those units of local government (including, but not limited to, school districts and the county itself in appropriate cases) which have incurred the loss or reduction in real property tax revenues by reason of existence of such area.”

In essence, the Act directs the counties or lowest unit of government that collects and distribute taxes to distribute refuge revenue sharing payments in the same proportion as it would for tax monies received.

Lands in which the Service has acquired an easement remain in private ownership and the landowner retains the obligation to pay property taxes. For ex-

ample, if the Service obtained an easement to preserve vegetation along a stream, the landowner would still control all other rights, such as access by the public, and would retain the obligation to pay the taxes on the tract.

Lands in which the Service holds only an easement and no fee title interest do not qualify for revenue sharing payments since the landowner is still obligated to pay property taxes.

4.3.5 Private Property Rights Adjacent to Refuge Lands

Service or other agency control of access, land use practices, water management practices, hunting, fishing, and general use next to any tracts acquired under Alternatives 1-4 is limited only to those lands in which the Service has acquired that ownership interest. Any landowners adjacent to lands acquired by the Service retain all the rights, privileges, and responsibilities of private land ownership including the right of access, hunting, vehicle use, control of trespass, right to sell to any party, and obligation to pay taxes.



4.3.6 Cultural Resources

Cultural resources include:

- Historic properties (historic, architectural, and archeological objects, sites, and districts meeting the criteria for the National Register of Historic Places.)
- Other archeological sites.
- Indian cultural items (human remains, funerary objects, sacred objects, and objects of cultural patrimony.)
- Cultural and sacred places.
- Collections (artifacts, documents, etc.).

Refuge establishment and land acquisition alone would have no effect on most cultural resources, but could have an adverse effect on standing structures. The Service tries to avoid the acquisition of structures that have preservation value. When the Service does acquire structures, they are seldom acquired with the intent to maintain and preserve them, and neglect as well as demolition is an adverse effect. Cultural resources receive increased protection from unconsidered destruction because of the several Federal laws that apply to property owned and administered by the Federal government. The Service might, however, affect some cultural resources when it develops Refuge land for wildlife habitat, administrative facilities, and public use area.

The several alternatives being considered would affect cultural resources in various ways. The No Action Alternative would likely have long-term negative impacts on cultural resources in the area as private development of the land continues. The Action alternatives would have a generally positive impact on the preservation of cultural resources because the Service recognizes the need to protect them. But some loss could occur in the event of Refuge development (roads and buildings), plowing, timber harvesting and fire suppression.

The Service will ensure that cultural resources are appropriately considered. The Service's Division of Realty will inform the State Historic Preservation Officer of acquisitions of lands and structures. Structures considered to meet the criteria for the National Register of Historic Places will be maintained until the Regional Historic Preservation Officer can complete evaluation and appropriate mitigation is accomplished. In the case of significant structures, the Service will consider how the historic property can be retained and used for Refuge purposes.

A description of each project, activity, and permit on the future Refuge will be provided by the Refuge Manager to the Regional Historic Preservation Officer who will analyze them for potential effect on historic properties. The Regional Historic Preservation Officer will enter into consultation with the Ohio Historic Preservation Officer and other parties as appropriate. No undertakings will proceed until the Section 106 process is completed.

With the assistance of the Regional Historic Preservation Officer, the future Refuge Manager will develop a program for conducting Section 110 inventory surveys and will attempt to obtain funding for those surveys. The Refuge Manager will similarly involve the Regional Historic Preservation Officer in other historic preservation and cultural resources issues on the Refuge in accordance with applicable laws, regulations, and Service policy.

4.3.7 Public Use

The 1997 Refuge Improvement Act has emphasized that the wildlife-dependent uses that include hunting, fishing, environmental education and interpretation, wildlife observation and wildlife photography are priority uses on refuges when compatible with the wildlife purposes of the refuge. Region 3 of the U.S. Fish and Wildlife Service includes an eight-state area of the Midwest. Of the 56 national wildlife refuges in Region 3, only seven are completely closed to public use. Those seven include islands and caves that contain nesting colonies of birds or endangered species (bat species and cave fish).

Specific areas of a refuge may be closed for biological reasons seasonally, but in general wildlife-dependent public use is encouraged on national wildlife refuges. Most refuges contain such public use facilities as wildlife observation areas, visitor contact stations, hiking trails, fishing access, and environmental education sites.

4.3.8 School District Revenue

School districts that are partially within the project area are shown in Figure 12 with the boundaries for the Alternative 2 Voluntary Purchase Area overlaid. The percent of each district's acreage that falls within the Alternative 2 Voluntary Purchase Area and Watershed Conservation Area is shown in Table 7. The percent of the school districts that fall within the Voluntary Purchase Area, where the Service may acquire some residences, ranges from 24 percent for the Jonathan Alder School District to 0 percent for the Mechanicsburg, London City and Jefferson School Districts.

The discussion in the Economic Impact Assessment (Appendix H) shows that school district revenue is not likely to be impacted significantly, or at all, by any of the Action alternatives for the proposed project. The School District Base Funding Level is determined in the main from the state foundation formula. Any

Table 7: Percent of School District Areas Within the Voluntary Purchase Area and Farmland Preservation Area under Alternative 2 (Preferred Alternative)

School District (Total District Area*)	Percent of School District Within the Voluntary Purchase Area	Percent of School District Within the Farmland Preservation Area
Fairbanks Local School District (86,946 acres)	8	18
Jefferson Local School District (25,613 acres)	0	8
Jonathan Alder Local School District (68,982 acres)	24	9
London City School District (38,896 acres)	0	1
Mechanicsburg Ex Vill (38,746 acres)	0	4

** Acreages taken from 1994 Census Bureau data, compiled by Wessex, Inc., 1997*

losses due to changes in the assessed valuation of property are compensated by the state up to a maximum determined by the formula. In the long run, regular re-assessment of property in the counties would possibly reduce the increase in the state contribution. Potential reductions in separate school district levies due to refuge acquisition will be compensated for by the Refuge Revenue Sharing payments. Overall, identifiable property and school district tax losses attributable to refuge land acquisition should be marginal to non-existent over the 30-year life of the project.

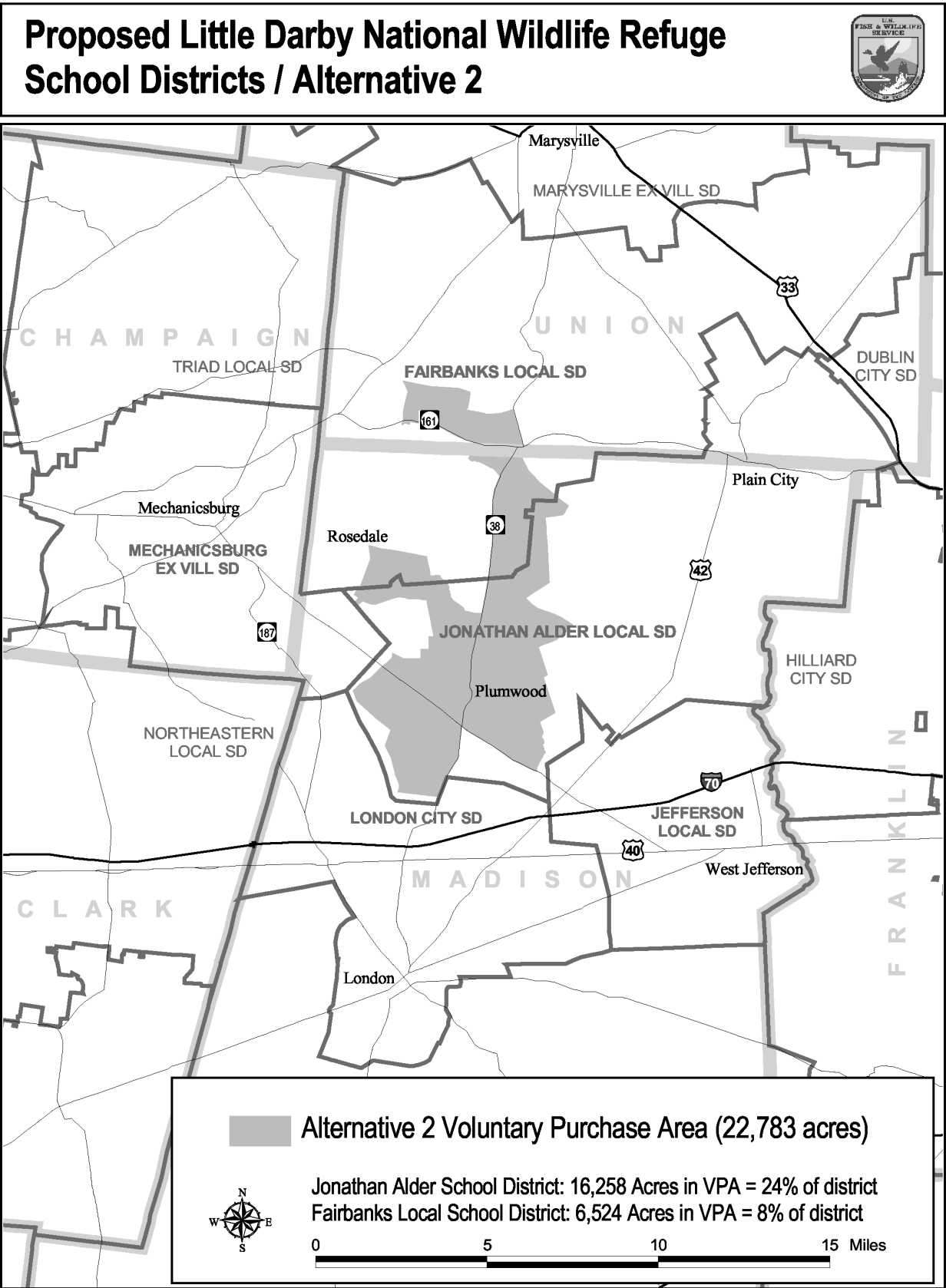
4.3.9 Community Involvement

The Service will commit to work with the townships within the project area to develop a Memorandum of Understanding laying out a formal process to keep the townships informed of and involved in major and relevant policy and management changes (Appendix I-1) on the refuge. This memorandum will be incorporated into the Comprehensive Conservation Plan that the Service will develop if the refuge is established.

Community involvement is a way of business on a national wildlife refuge. A few examples of the forms community involvement take are listed as follows:

- Community involvement in management and planning is an ongoing process on a national wildlife refuge. A variety of plans are developed to guide management of a refuge and the public is asked to participate in the development of those plans.
- Volunteers are also an integral part of any refuge, not only providing valuable assistance to the refuge staff, but also providing members of the community an opportunity to interact on a regular basis with refuge staff and to see firsthand what is happening on the refuge.
- Refuges host regular open houses and special programs to provide opportunities for anyone to learn more about what is happening on the refuge.

Figure 12: School Districts Within the Project Area



- Through the Service's Partners For Fish and Wildlife program and regular refuge operations, refuge staff will be available to assist private landowners who may be interested in doing upland and wetland habitat restoration or management work on their own property.
- Refuges serve tens of thousands of school children annually by providing an outdoor learning laboratory in which they can learn about wildlife and habitats.

4.4 General Impact Analysis

4.4.1 Unavoidable Adverse Impacts

Under Alternatives 1-4, the potential development of access roads, control structures, visitor parking areas, and reclamation of former building sites could lead to local and short-term negative impacts to plants, soil, and some wildlife species. Some loss of cultural resources could occur by restoring former wetlands and grasslands. Greater public use may result in modest or seasonal increases in littering, noise, and vehicle traffic.

4.4.2 Short-Term Use Versus Long-Term Productivity

The local short-term uses of the environment under Alternatives 1-4 includes restoration of lands to wetlands, grassland, and forested riparian complexes. Alternatives 1-4 could include development of public use facilities. The resulting long-term effect of these alternatives include increased protection of threatened and endangered species, increased waterfowl habitat, songbird production, and long-term protection and recovery of a myriad of species dependent on quality wetland and grassland habitat. Downstream from the proposed refuge, water quality would be indirectly improved in the long-term. The local public will gain long-term opportunities for wildlife-oriented recreation and education.

4.4.3 Irreversible and Irretrievable Commitments of Resources

An irreversible commitment of resources results when an area is altered in such a way as it cannot be returned to its natural condition for an extended period of time. Use of a nonrenewable resource also constitutes an irreversible effect. Irretrievable commitments of resources occur when a renewable resource is allocated to a given use.

Acquisition of lands acquired for the National Wildlife Refuge System would be irreversible even though some refuge lands may very rarely be exchanged for a refuge management purpose. Government fee title acquisition removes acreage from private ownership and the benefits associated with it.

Without changes in laws, most wetland restoration of Refuge fee lands would be irreversible. The Clean Water Act and state statutes would make it difficult to reconvert restored wetlands to a drained condition without a congressional mandate.

If the No Action Alternative (Alternative 5) was chosen, continued conversion of open space lands to residential uses, such as residential housing, would be in many cases an irreversible action. Remnant prairie cannot be completely reestablished following even brief periods of intensive agricultural use or mineral extraction that disrupts the land surface. Minerals extracted from area lands,

only where mineral rights were reserved, are not renewable and would be irreversibly lost as a future resource.

Although visitor facilities would be a wildlife-dependent recreational opportunity in the Voluntary Purchase Area of the refuge, some irreversible loss of habitat would occur at construction sites of new facilities such as administrative offices, parking lots, restrooms and other visitor facilities. This effect would be mitigated by their function in confining major impacts of visitors to relatively small areas and promoting public support for resource needs. It would also be mitigated by habitat restoration accomplished through the proposed action.

Wildlife taken by hunting and trapping, predator control, depredations control and research or field study would not be available for wildlife viewing and photography by other users. Expanded opportunities through increased lands available would be managed in such a way that the health and viability of wildlife populations would not be threatened.

Under Alternatives 1-4, funding and personnel commitments by the Service or other organizations would be unavailable for other programs. Fee-title acquisition of lands by the Service would make them “public lands” and preclude other long-term uses in accordance with individual desires unless mandated otherwise by the U.S. Congress. Traditional land uses may change since uses on Service lands must be shown to be compatible with the purposes for which the land is acquired. Any lands purchased in fee or where protective easements are in place, such as purchase of development rights, will lose their potential for future development by the private sector as long as they remain in public ownership. Structural improvements that may be purchased with any land may be declared surplus to government needs and sold or demolished on site. This would be minimal.

4.4.4 Maintenance of Roads and Existing Right-of-Ways and Access

State, county, and townships retain maintenance obligations for roads and their rights-of-way under their jurisdiction within refuge boundaries. Just as taxes contribute to road maintenance, Refuge Revenue Sharing payments can also be used by local governments for maintenance. Since Refuge Revenue Sharing payments exceed local taxes even if payments of only 70 percent of full entitlement are made, road maintenance should not be adversely affected by a refuge. Some township roads may be suited for abandonment (but not necessarily closure) and their maintenance assumed by the Service. Any such abandonments would only be with the approval of the appropriate governing body. Existing rights-of-ways and terms of other easements will continue to be honored. New rights-of-ways and easements and expansion of existing rights-of-ways on Service-owned lands will be considered in relation to Refuge System regulations and likely impacts of the rights-of-way or easement to refuge resources. The Service has traditionally worked cooperatively with local authorities to permit needed expansion of existing roadways.

The Service has no authority to require permits to travel on public roads through a national wildlife refuge. In addition, where a landowner has legal access to his or her property, the Service could not unilaterally change that access.

4.4.5 Emergency Services

As needed, the Service may enter into a cooperative agreement or agreements with emergency and fire service agencies and organizations on a cost reimbursable basis in order to protect public facilities and foster cooperation and coordination with established refuge programs. Landowners living within any established refuge boundary will still receive their emergency services from local authorities. The Service cannot restrict ingress or egress on public roadways.

4.4.6 Madison County Airport

The Madison County Airport, identified by Federal Aviation Administration (FAA) Site No. 18101.21A, is located in Somerford Township approximately 2 miles north-northeast of London High School and 3-4 miles south-southwest of the southernmost boundary of the Voluntary Purchase Area. The facility operates under Visual Flight Rules (VFR) and has one 4,000-foot, east-west runway. There is no on-site radar, however, the airport does maintain navigation aids for aircraft using the facility during inclement weather. An additional 4,000-foot north-south cross-runway was proposed in 1983, but has yet to be constructed (FAA, 2000).

As of 1998, the FAA Airport Master Record listed the following inventory of based aircraft:

Single engine-prop	42
Multi-engine-prop	1
Jet	0
Helicopter	2

Operational records for the same year indicated that a total of 41,418 landings and take-offs occurred. Some of this activity is related to flight instruction business. It is suspected that a fairly large segment of this activity, however, is due to the availability of lower priced aviation fuel. Private and commercial single engine aircraft flying out of Columbus, Ohio, facilities make routine stops at the Madison County Airport to refuel. It has been recently reported that aviation fuel is 40-60 cents per gallon less expensive than at other metropolitan airports.

Due to the type of grassland and wetland habitat restoration that is proposed for the refuge and the classification of the airport, bird-aircraft conflicts are not anticipated. The Service manages refuges within metropolitan areas that have much greater volumes of air traffic without incident. For example, there are at least six to eight refuges concentrated in the Hampton Roads area of Virginia. They coexist among high levels of military and commercial air traffic. The Minnesota Valley National Wildlife Refuge is located within 1 mile of the Minneapolis International Airport and on a major glide path for the facility.

The FAA has reviewed the Service's proposal for the Little Darby National Wildlife Refuge and has cited no objections to it. (See letter number 795 in Appendix M.)

4.4.7 Seismic Activity

The project area is located near Grenville Front, a fault line running vertically through west-central Ohio. Ohio also has several other fault lines, including the Bowling Green fault in northwest Ohio and the Cambridge fault in east-central

Ohio. These faults have been responsible for a number of earthquakes in recent and distant history.

The impacts of an earthquake on the project would vary depending on the size of the quake. Historical data does not demonstrate that any significant seismic activity has occurred in the vicinity of the project in nearly 200 years of record keeping. An earthquake of great magnitude could also destroy building structures and alter topography.

If seismic activity were a significant threat, then it would be safe to assume that local land use plans would discourage development in areas most susceptible to quakes. We have found no evidence of such concerns by local or state units of government.

Concerns have been raised that a quake could allow water in a restored wetland to infiltrate the groundwater table. This may or may not be true, depending upon the depth of a crust fracture and its location. However, water quality in a wetland is generally very good due to the natural filtration characteristics of wetland vegetation. From the standpoint of disaster prevention, a wetland or restored grassland above a fault is less likely to cause water quality problems or societal hardships than if a residential area or farming operation (such as manure storage area) were located in that spot.

4.4.8 Fire Management

Controlled burns are a routine means of managing grasslands. Fire management on any lands acquired by the Service would be within a well defined fire management plan. The Service requires any personnel participating in a controlled burn to have had a series of required fire management courses. The Service has been using fire for decades to manage habitats and has built a cadre of well trained staff to conduct the burns safely. Specialized equipment, such as four-wheeled drive pumpers, all-terrain vehicles, and wetting agents, are used in conducting a controlled burn.

Fire management in the Little Darby area would be facilitated by the extensive cropped fields in the area. Burns are generally conducted in the early spring or late fall, when crops generally have been harvested. Therefore, in addition to the fire breaks the Service would employ, there would be a considerable number of natural breaks in the area. Neighbors and local fire and sheriff's departments would be notified prior to any burns. Wind conditions, fuel moisture, and humidity are important factors in determining if conditions are appropriate for a burn. Burns would be designed to minimize problems from smoke on roads or blowing to residences.

The Service burns thousands of acres in the Midwest annually in a safe manner that minimizes any impacts off Services lands. It is anticipated that controlled burns could be safely used in the Little Darby project area without any negative impacts to the community, other than a very temporary minor impact from smoke.

Table 8 on the following page summarizes the possible impacts or consequences related to the proposed Little Darby National Wildlife Refuge.

Table 8: Summary of Possible Impacts or Consequences of Each Alternative by Issue and Opportunity

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Threatened or Endangered Species Preservation	SP	P	P	P	Neg.
Resident Fish and Wildlife Enhancement	P	SP	SP	SP	Neg.
Wetlands Preservation or Restoration	P	SP	P	SP	Neg.
Biodiversity Restoration	SP	P	SP	P	Neg.
Wildlife Disease	N	N	N	N	N
Effects on Drainage	N	N	N	N	N
Groundwater Preservation or Improvement	N	P	SP	P	PN
Effect on Surface Hydrology	P	P	P	P	PN
Tax Impacts (Property and School District)	N	N	N	N	N
Economic Impacts	N	N	N	N	N
Protection of Leased Agriculture Land	PN	PN	PN	PN	Neg.
Farmland Protection	Neg.	SP	SP	SP	Neg.
Development Impacts	PP	PP	PP	PP	PN
Restricts Private Property Rights or Interferes with Agriculture Operations	N	N	N	N	N
Public Uses	P	P	P	P	N
Refuge Management	P	SP	P	SP	N
Relocation	N	N	N	N	N
Cultural Resources	P	P	P	P	Neg.

Legend

P: Positive
SP: Somewhat Positive
PP: Potentially Positive
N: Neutral
PN: Potentially Negative
SN: Somewhat Negative
Neg.: Negative